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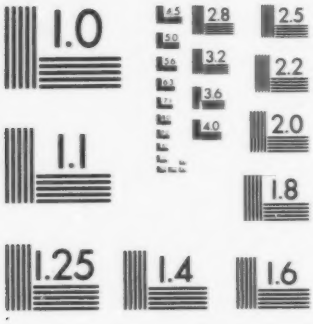

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Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

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INVESTIGATION REPORT INTO THE CIRCUMSTANCES ATTENDING THE COLLISION BETWEEN THE CANADIAN LAKER "JOHN B. AIRD" AND A CANADIAN YACHT LICENCE N° 32 E 30450 IN UNITED STATES WATERS OFF CHIPPEWA POINT, NY, ON JULY 30, 1986

REPORT No. 454

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INVESTIGATION REPORT INTO THE CIRCUMSTANCES ATTENDING THE COLLISION BETWEEN THE CANADIAN LAKER "JOHN B. AIRD" AND A CANADIAN YACHT LICENCE N° 32 E 30450 IN UNITED STATES WATERS OFF CHIPPEWA POINT, NY, ON JULY 30, 1986.

Particulars of Vessels

Name	"JOHN B. AIRD"	32 E 30450
Official Number	802923	As above
Port of Registry	Sault Ste Marie	Licence issued Ottawa
Call Sign	VCYP	
Gross Tonnage	22,881.02	Displacement 10,300 kg.
Net Tonnage	16,162.71	18.135
Length	222.5 m	12.65 m
Breadth	23.47 m	3.68 m
Depth	14.20 m	
Draught	F. 4.57 m A. 7.47 m M. 6.02 m	1.68 m
Type	Self-unloading Bulk carrier	Yacht, Airex fibre-glass sandwich construction
Built	1983, by Canadian Shipbuilding and Engineering Ltd. Collingwood Ontario	Hull in 1982 by Corbin Les Bateaux Napierville Quebec
Propulsion	Two, MAK turbo-charged diesel engines geared through reduction gear to a single shaft and a controll-able pitch, bridge controlled propeller. Max. 9464 bhp.	Perkins 50 hp diesel
Bow Thruster	One	

Cargo	11,200 t Coke and Potash	Nil
Crew	27	3
Classification	ABS + AI Great Lakes and St. Lawrence River	Scantlings exceed Lloyd's requirements for this type of vessel
Owners	Algoma Central Railway Sault Ste. Marie Ontario	Ohannes Paul Basmadjian Dollard-des-Ormeaux Québec

Navigating Equipment

Radar 1	Racal-Decca Type 65121	Nil
Radar 2	Racal-Decca Type 65121 Racal-Decca Video processor Type 65301 JHA	Nil
Echo Sounder	Simrad D-162	Nil
Loran	Sea-tex 770	Nil
VHF 1	Marconi SRA ME 61	President NC 722
VHF 2	Marconi SRA ME 61	Nil
VHF 3	Marconi SRA ME 61	Nil
Communication System	Inmarsat	Nil
Gyro 1	Sperry MK 37	Nil
Gyro 2	Sperry MK 37	Nil
Autopilot	Sperry	Nil
Magnetic Compass	Sestrel reflecting	Wagner 6"

Description of vessels

The "JOHN B. AIRD" is a self unloading bulk carrier classed for the Great Lakes and St. Lawrence River service. Her accommodation and wheel-house are situated aft.

Yacht 32 E 30450 is an unfinished ketch equipped with a diesel engine; neither mast, rigging nor sails had yet been installed. Her cockpit, which contains the steering wheel, is situated at two thirds the yacht's length from forward.

NOTE: All times in this report are Eastern Daylight Saving Time (UTC - 4 hours).

Background

Shortly before 1700 on July 30, 1986, a witness, from his home in Chippewa Point, N.Y., saw that the downbound Canadian vessel "JOHN B. AIRD" had a yacht caught across her bulbous bow. After arranging for a member of his family to inform the United States Coast Guard (USCG) of the incident the witness boarded his speedboat and went to the assistance of the yacht. He succeeded in drawing the attention of the "JOHN B AIRD's" bridge personnel to the fact that their vessel was pushing a yacht caught across her bow and, at about 1710, after a reduction of speed by the laker, the yacht was able to come free.

Due to the impact of the collision, two of the three crewmembers on the yacht fell and suffered some bruising.

The yacht received damage and preliminary estimates for repairs are in the range of $35,000. The "JOHN B. AIRD" sustained no damage and no pollution was caused.

Although the damage occurred in contiguous U.S. waters, an inquiry under the Canada Shipping Act was ordered and held in Canada because both vessels were Canadian.

Narrative

As there is some contradictory evidence regarding the circumstances surrounding the collision, the versions of both vessels and of the independent witness are described separately.

Yacht 32 E 30450

Canadian yacht, licence number 32 E 30450, was bought from the manufacturer in 1982 as an unfinished hull. The yacht was engined and the interior 90% completed professionally by her owner and a member of his family at a marina in Rideau Ferry, Ont. On July 29, 1986, she sailed, under power, for Longueuil, Quebec, where she was to complete fitting out and have her ketch rig installed. There were three persons on board.

After having spent the night at Kingston Mills, Ont, the yacht resumed her passage under power at 1000 on July 30, 1986 down the Rideau Canal and then entered into the St. Lawrence River. She was navigated from buoy to buoy, and as it rained frequently, comparisons between her headings when aligned in the channel and those indicated by two uncompensated magnetic compasses in the cockpit were made. The compass error was noted as being 12° or 13°W. She entered the main ship channel via Wolfe Island Cut at about 1300.

As buoys were identified by the skipper their numbers were called out by him to a member of the crew below at the chart table who circled them in pencil on the chart. Not all buoys were annotated with the time at which the yacht passed them. The yacht passed under the Thousand Islands Bridge at 1500, and at 1644 buoy 167 was abeam to starboard. At this time the yacht was to the port side of the channel course line indicated on the chart, and Superior Shoal Light was sighted on the starboard bow. An approximate average speed of 5.5 knots had been maintained since leaving Kingston Mills and 6.85 knots since passing under the Thousand Islands Bridge.

A few minutes after 1644 the skipper heard the sound of rushing water astern on the yacht's starboard quarter and turned his body to the right towards the source of the sound. He saw the bow of a large vessel, preceeded by a 'wall' of water, bearing down on the yacht. The vessel was later identified as the "JOHN B. AIRD".

The yacht's wheel was put hard to port in an attempt to avoid a collision. In spite of this, her head turned to starboard. The port side of the bulbous bow of the "JOHN B AIRD" struck the yacht's starboard side at about 1/3 of the yacht's length from forward. One of the yacht's crew was flung across the cockpit by the force of the collision and another one was thrown across the cabin. Both sustained bruising.

After impact, the yacht heeled over slowly to port coming to rest at an angle of about 45° with her deck line submerged. A small amount of water entered the after cabin before the windows were closed, however, as it had been raining intermittently throughout the day all the deck hatches had been closed previously. No water entered the cockpit.

The yacht remained balanced in this position, heeled over, and with 1/3 of her length projecting forward of the bulbous bow of the "JOHN B. AIRD", as the latter vessel continued steaming ahead at her normal operating speed.

Lifejackets were passed from the cabin and were donned by the three crew members who mustered in the cockpit and who were in a state of shock.

Various combinations of helm and engine movements were tried to free the yacht from the bow of the "JOHN B. AIRD". After some minutes had passed, the skipper went forward and tried to push the yacht's bow off the laker but this proved to be impossible. A member of the crew was meanwhile hammering on the hull of the "JOHN B. AIRD" with the yacht's unfitted rod bobstay in an attempt to draw attention.

At a time estimated to be between 5 and 10 minutes after the collision, a small power boat was seen by those on the yacht to cross ahead of the "JOHN B. AIRD" from starboard to port and to pass down her port side. The power boat's occupant was seen to wave his arms and a red flag. He was also seen to be gesticulating towards the bow of the "JOHN B. AIRD" and was heard to be shouting.

After the collision, two red buoys were observed from the yacht to pass to port at a distance of about 25 to 30 metres. One green buoy was also observed to pass to starboard of the "JOHN B. AIRD". These buoy numbers were not noted. During this period, the "JOHN B. AIRD" was observed to be slowing down. The yacht started to slide aft against the port side of the "JOHN B. AIRD" for a distance of about 30 metres before sheering off to port under the influence of her helm, which was hard to port. On coming clear it was noted that the yacht was in the vicinity of buoy 160, and that the time was 1710.

After the yacht came free and as she was being overtaken by the "JOHN B. AIRD", attempts to communicate by voice were made with a crewmember seen to be looking out of the port side wheelhouse window; no reciprocal contact was established due to noise. No attempt to communicate by VHF radio was made.

The yacht was stopped near buoy 160. Checks were made to establish if she was making water and it was noted then that neither of her two automatic bilge pumps had switched on. A third electric bilge pump was switched on manually but no water was seen to be discharging over the side. The yacht's anchor rope, which had been flung overboard by the force of the collision was recovered.

The yacht was offered assistance by the same power boat which had signalled the "JOHN B. AIRD" but the offer was courteously declined by the yacht's skipper. A short time later the yacht was escorted to the Brockville Marina in Brockville, Ontario by another pleasure craft which happened to be in the area at the time of the collision. These two vessels arrived at the marina at about 1830 the same day. It was noticed en route that while under power the yacht was vibrating more than she did before the collison.

"JOHN B. AIRD"

The "JOHN B. AIRD" sailed from Port Stanley, Ont, at 0715 on July 29, 1986, with a cargo of 11,200 tonnes of potash and coke for discharge at Côte Ste. Catherine and Sept-Iles, QC. She passed through the Welland Canal and left Port Weller at 0145 on July 30, 1986. She crossed Lake Ontario and arrived off Tibbets Point, NY, at 1332 the same day.

At 1300 the chief officer relieved the master and, as on frequent other occasions, piloted the vessel down the St. Lawrence River. Assisting him were the second officer, who was the officer of the watch (OOW), and a helmsman who was at the wheel. Both radars were switched on and information from them was presented on a television screen on the central control console at the centre window position on the bridge front bulkhead. The main engines were on bridge control and manoeuverable from the centre and port and starboard consoles. The VHF radios were working, one on the calling and distress frequency, channel 16, and the other on the working frequency for the area, channel 13.

During the vessel's passage down river, which had been normal and uneventful, no position was marked on her charts, however the times of passing various points were noted to enable the OOW to monitor the vessel's speed. These times are tabulated below.

Place abeam	Time	Interval minutes	Charted distance nautical miles	Av. Speed knots
Tibbets Point Light	1332	-	-	-
Banford Point Light	1418	46	11.16	14.56
Bartlett Point Light	1449	31	6.05	11.71
Rock Island Tower	1525	36	4.88	8.13
Comfort Shoal Light	1554	29	4.12	8.52
Deer Island Light	1612	18	2.60	8.67
Buoy 162	1700	48	8.82	11.03
Crossover Island	1705	5	1.18	14.16

The vessel was reported to have been kept to the tracks shown on her Canadian Hydrographic Service (CHS) charts, and consequently, when she was off Haskell Shoal near buoy 173, course was altered to 040°(T) to pass abeam of buoy 162. From the table above, it will be seen that she was making about 11 knots over the ground.

At about 1700, with buoy 162 on the port beam, the vessel was brought round to her next course of 014° (T). She was in the white sector of Crossover Island Range Light.

As the vessel was steadying up on her new course, it was reported that two power boats were seen from the bridge of the "JOHN B. AIRD" to cross her bow from starboard to port. Both disappeared under the bow of the "JOHN B. AIRD" and only one, which was reported to be moving faster than the other, was seen to emerge on the port side.

As this power boat passed down the port side of the "JOHN B. AIRD", her occupant was observed by the OOW from the port side wheel-house window to be trying to attract attention. The occupant was heard to shout that there was a boat caught across the ship's bow.

The OOW reduced the vessel's propeller pitch control on the port console to about slow ahead and the chief officer then again reduced speed to about dead slow ahead at the centre console. The master was called to the bridge and he further reduced propeller pitch to that which would provide bare steerage way.

As this was happening the "JOHN B. AIRD" was called by

the United States Coast Guard Base at Alexandria Bay on VHF radio, channel 16. The call was timed at 1702, and the message passed by this means informed the vessel that there was a boat caught across her bow.

On receipt of this message the OOW was ordered to go forward to verify if the boat was indeed on the bow. As he was at hatch 5 making his way up the port side, a yacht was observed below, sheering off the side of his ship. A person aboard was heard to be shouting up to him, and it was determined that all aboard the yacht were safe. It was observed that the yacht was heading downstream, appeared undamaged, and was trailing a length of rope astern.

The "JOHN B. AIRD" was unable to stop with safety in that part of the channel, and seeing that the yacht appeared to be safe and escorted, continued her passage.

Independent Witness and General Information

Some minutes before 1700, a witness observed through binoculars from his home on Chippewa Point, NY, that the downbound "JOHN B. AIRD" had a yacht, which he estimated to be between 35 to 40 feet long, caught across the bow. It was also noted that the yacht's bow was pointing in a general direction towards him and that approximately 1/3 of the yacht's length was across the bow of the cargo vessel. It was observed that three persons were in the yacht's cockpit, all of whom were wearing lifejackets. It was estimated by the witness that the "JOHN B. AIRD" was off Superior Shoal Light which is about 1/2 mile distant from his viewing point.

After having asked the operator for an emergency telephone number of the USCG, the witness instructed a member of his family to inform them of the incident. The call was transferred from USCG Oswego, NY, to USCG base at Alexandria Bay, NY, at 1700. Another message was received by the USCG at Alexandria Bay from Blind Bay Marina at 1702 again informing them of the incident.

Acting on the information thus received from two sources, the USCG at Alexandria Bay entered into communication with the "JOHN B. AIRD" on VHF channel 16 at 1702. A USCG rescue boat was tasked and underway to the scene from Alexandria Bay at 1703.

In the meantime the witness had gone to the boat-house in his garden, started and warmed up the engine of his 17 foot power boat, and raced out to give assistance to the crew of the yacht.

He crossed ahead of the "JOHN B. AIRD" from starboard to port downstream of buoy 162, and passed down the port side of that vessel, waving his arms and a USCG approved red distress flag. An attempt was also made to set off a distress rocket but this was unsuccessful. A person was seen to be looking in his direction from the laker's port side wheel-house window. The power boat then took up station off the bow of the "JOHN B. AIRD" and was waiting to assist the occupants of the yacht as soon as this could be achieved without endangering the power boat.

From the power boat, the yacht was seen to separate from the fore part of the "JOHN B. AIRD" at a time estimated to be about 1710. Both vessels were in the vicinity of Crossover Island at that time. The power boat then went alongside the yacht to offer assistance.

At 1715 the "JOHN B. AIRD" reported to the USCG at Alexandria Bay that the yacht was clear of her bow, that all on board the yacht were accounted for, and that the yacht appeared to be undamaged.

The USCG rescue boat was redirected to another emergency at 1724.

Analysis

1. Weather and current conditions

From both the yacht and the "JOHN B. AIRD" rain and fog were recorded during the morning of July 30, 1986. The crew of the yacht were in oilskins all day. The sky was overcast. At the time of the accident there was no precipitation and visibility was estimated to be between 5 and 10 miles by those on watch aboard the "JOHN B. AIRD", and under 5 miles by the skipper of the yacht.

Weather conditions as recorded at USCG Base, Alexandria Bay, were:

Time	Sky	Visibility	Wind	Air Temp.	Water Temp.	Barometer
1400	Cloudy & haze	7 miles	N x 10k	20°C	19°C	1008 mb
1600	Cloudy & haze	6 miles	N x 12k	20°C	19°C	1009 mb
1800	Cloudy & haze	6 miles	N x 10k	20°C	19°C	1009 mb

The Sailing Directions for the Great Lakes, Volume 1, state:

> In September 1978, current measurements were taken in the vicinity of Blind Bay. From a position close upstream of Peach Island, to Blind Bay, the current sets across the channel in a NE direction at a rate of less than 1 knot. Between Blind Bay and the upstream end of Chippewa Point, the current sets across the channel in a NNE direction at a rate of less than 1 knot.

It was reported that the person piloting the "JOHN B. AIRD" was paying particular attention to the effect of this current on the approach to, and when altering course at, buoy 162.

2. **Timing of events**

There were inconsistencies in the recording of the times of events by both vessels.

Those on board the yacht were not very familiar with the 24 hour clock, although all the times noted were recorded using this method. It was recorded on the chart that buoy 167 was abeam at 1744, shortly after which the vessel was reported to have collided with the "JOHN B. AIRD".

The yacht was observed by an independent witness to be caught across the bow of the "JOHN B. AIRD" shortly before 1700 when both vessels were in the vicinity of Superior Shoal Light, about 1.2 miles upstream of buoy 162. At this time the occupants of the yacht were observed by the witness to be wearing lifejackets, which they had had time to don after the collision.

It was further recorded aboard the yacht that the two vessels separated near Crossover Island at 1810. This event was estimated to have taken place by the independent witness at about 1710, and was reported to the USCG by the "JOHN B. AIRD" at 1715.

From the above it will be seen that the yacht was abeam of buoy 167 at 1644 and near Crossover Island at 1710, and that an error of 1 hour was made in the recording of these two events. Other times, as recorded by the yacht, were not called into question.

The master of the "JOHN B. AIRD", in common with the

masters of other Great Lakes vessels, is under orders from his vessel's owners to pay particular respect to speed limits in the St. Lawrence Seaway. To this end, the OOW's duties include the making of speed checks, and a procedure is established by which these checks are carried out at standard places on the transit.

From the tabulation of these results in the narrative, it is evident that there is an anomaly in the vessel's speed between buoy 162 and Crossover Island. The "JOHN B. AIRD" was aware of the presence of the yacht across her bow during this period, and was being slowed down, and was not, as shown by the figures, increasing her speed.

As discussed above, the yacht came free of the "JOHN B. AIRD" at about 1710, near buoy 160, at Crossover Island, a time corroborated by the independent witness. Further the "JOHN B. AIRD" reported to the USCG that all persons were accounted for etc., at 1715. Given the time required to obtain the information and to make the report, it is probable that the "JOHN B. AIRD" was at Crossover Island at 1710 and not at 1705 as recorded in her speed check calculations.

It was impossible to establish the time of collision precisely, but it is known to have taken place after 1644 when the yacht was abeam of buoy 167 and before the two vessels were observed by the independent witness to have already collided off Superior Shoal.

From the speed check table it will be seen that the "JOHN B. AIRD" was abeam of buoy 162 at 1700. Her average speed made good to this point from Deer Island Light was 11.03 knots.

Superior Shoal Light is 1.2 miles upstream of buoy 162 and, as noted above, those on board the yacht had already donned their lifejackets after the collision. The collision had taken place therefore some time before both vessels were in this position.

An estimation of the time at which both vessels were seen by the independent witness at Superior Shoal may be calculated thus,

$$1700 - \left(\frac{1.2}{11.03} \times 60\right) = 1653\tfrac{1}{2}$$

The collision took place therefore between 1644 and 1654, and the two vessels separated at 1710. Given that

the collision may have occurred as late as 1654 and the radio call from Alexandria Bay was timed at 1702, the "JOHN B AIRD" was unaware of the presence of the yacht across her bow for a period of at least 8 minutes and if the collision occurred as early as 1644 then the presence of the yacht across the laker's bow may not have been known to the bridge personnel for a period of up to 18 minutes.

3. **Place of collision**

As shown in the calculation of the time of events the two vessels collided upstream of Superior Shoal Light and downstream of buoy 167. Further, two red buoys and one green buoy were observed from the yacht to have been passed after the two vessels collided. The only buoys in this area of the channel are 163A (green) and 164 and 162 (red). As the "JOHN B. AIRD" was rounding buoy 162 at 1700 it was reported two power boats were seen to cross her bow from starboard to port, and to disappear under the bow. It was reported that only one boat was seen to emerge. The officer piloting had been engaged in swinging the vessel through 26° to port at this time and the power boats were reported to have been seen out of the corner of his eye. It was believed on board the "JOHN B. AIRD" that the collision occurred at this time, but as shown above the yacht had already been caught across her bow for over 6 minutes. The other officer on the bridge, the OOW, was at this time behind the chart table and did not observe any boats crossing.

The independent witness reported that he crossed ahead of the "JOHN B. AIRD" downstream of buoy 162, and it is possible that it was this movement that was detected by the officer piloting the "JOHN B. AIRD" and that there was only one boat, not two.

It was reported that there were about 10 other pleasure craft in the immediate area over that period of time.

4. **Visibility from the yacht**

The yacht, being unrigged, had unrestricted visibility all round her horizon. It was estimated that the height of eye of the skipper, when standing at the wheel, was about 10 feet. The distance of the sea horizon for this height of eye is given in standard publications as 3.7 miles. An object such as the "JOHN B. AIRD" would have been visible above the horizon up to the limits of the visibility as reported by the yacht, which was in the order of 5 miles.

It was reported that, as the skipper's attention was mainly taken up by the navigation of his vessel, the approach of the overtaking "JOHN B. AIRD" was not observed by the skipper or the other person in the yacht's cockpit. The first indication that the "JOHN B. AIRD" was close was when the sound of the breaking water of her bow wave was heard. A proper look-out astern was not kept.

Rule 5 of the International Regulations For Preventing Collisions At Sea, 1972, states:

Look-out

> Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

The yacht was not equipped with radar and as she was unrigged, she did not have the ready means to display the passive radar reflector required for vessels of her size and construction in Rule 40 of the Canadian Modifications to the International Regulations For Preventing Collisions At Sea 1972. The consequences of the failure to display a radar reflector may have been to render the end-on aspect of the fiberglass yacht undetected by radar.

5. Visibility from the "JOHN B. AIRD"

At the time of the collision the draught of the "JOHN B. AIRD" was 4.57 m (15') forward and 7.47 m (24'06") aft. At this draught the centre of the wheel-house bridge front windows is 23.8 m, and the highest point of the forecastle head is 13.8 m, above the waterline, respectively. The horizontal distance between these points is 192.23 m.

At the above draught the visibility from the wheel-house may therefore be calculated as having been obstructed by the highest point of the forecastle for a distance of 265 metres forward of the bow at sea level. Some obstruction of the view forward is also caused by the foremast.

The height of eye from the piloting position of the "JOHN B. AIRD" was 23.8 metres. The distance of the sea horizon for this height of eye is given in standard

publications as 10.4 miles, greater than the actual visibility as reported by the vessel of 5 to 10 miles.

At 1644 the yacht was abeam of buoy 167. From the average speed of the "JOHN B. AIRD" between Deer Island Light and buoy 162 (11.03 knots) it may be calculated that the "JOHN B. AIRD" was about 0.8 mile astern of the yacht at this time.

It may also be calculated by this means that the "JOHN B. AIRD" passed Third Brother Island Shoal, when she would have had unrestricted visibility forward to beyond buoy 162, at 1635. It may be calculated from the average speed of the yacht (6.85 knots) that she was about 1.52 miles ahead of the "JOHN B. AIRD" at 1635.

Within the limits of the prevailing visibility, ± 5 miles, both vessels were in sight of each other from at least 1635 until the latest probable time of collision; 1653½. Both vessels were proceeding on much the same course.

During this period of about 19 minutes, the "JOHN B. AIRD", which was reported to have kept to the track shown on the chart, made a 15° alteration to starboard. The view of the yacht from the bridge of the "JOHN B. AIRD" could not therefore have been obstructed by the foremast of the "JOHN B. AIRD" for the whole of this period.

At the time of the collision, radar information was shown on the daylight display radar linked television screen at the conning position, as well as on the radar. If the radar echo of the yacht, which is of fiberglass construction, was indeed displayed on either the television or the radar screen, the echo was not seen, noted or monitored by the person piloting the vessel, nor by the OOW.

Similarly, the yacht was not seen visually by the officer piloting the ship or by the OOW until after she came free from the bow of the "JOHN B. AIRD". There was no lookout forward, nor would one be expected to be posted in the normal operating conditions existing at the time.

In view of the fact that a collision occurred, it can be stated that a proper look-out, as required by Rule 5 of the Collision Regulations, was not kept by those aboard the Great Lakes vessel.

6. Watchkeeping

Both vessels monitored their progress along their intended route by noting the time at which various lights etc. were passed. The yacht did so at more frequent intervals than the "JOHN B. AIRD".

The yacht had on board a VHF transceiver radio which was temporarily installed in a cupboard above the galley counter. A temporary antenna was clamped to the forward pulpit. The radio was operational, however it was reported that no attempt was made to transmit messages; its use was confined to receiving weather information.

No Radio Station Licence had been obtained for the yacht.

7. Collision Regulations

These Regulations incorporate the International Regulations For Preventing Collisions At Sea, 1972 and the Canadian Modifications.

Whether or not either vessel was aware of the presence of the other as a consequence of the lack of a proper look-out, each was subject to Part A, General Rule 1 of the above Regulations, which states, in part:

> (a) These Rules shall apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.

Rule 2, Responsibility, of the same Regulations, states in part:

> (a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

Rule 3, General Definitions, of the above Regulations, states in part:

> (k) Vessels shall be deemed to be in sight of each other only when one can be observed visually from the other.

As discussed in Analysis 5, each vessel was visible, one

from the other, for at least 19 minutes before the collision occurred. Those in charge of the navigation of both vessels reported that their respective vessels were kept on the track shown on CHS chart 1418 up to the point at which the collision occurred.

Each vessel was therefore on approximately the same course, and as their respective average speeds were 6.85 knots in the case of the yacht, and 11.03 knots in the case of the "JOHN B. AIRD", the "JOHN B. AIRD" was the overtaking vessel.

Rule 13, Overtaking, of the Collision Regulations, states, in part:

(a) Notwithstanding anything contained in the Rules of Part B, Sections I and II, any vessel overtaking any other vessel shall keep out of the way of the vessel being overtaken.

Yacht 32 E 30450 was reported to be proceeding slightly to port of the ship channel track in an area where the ability of the "JOHN B. AIRD" to alter course to starboard was restricted by her draught and size.

Rule 9, Narrow Channels, of the Collision Regulations, states, in part:

(a) A vessel proceeding along the course of a narrow channel or fairway shall keep as near to the outer limit of the channel or fairway which lies on her starboard side as is safe and practicable.

(b) A vessel of less than 20 metres in length or a sailing vessel shall not impede the passage of a vessel which can safely navigate only within a narrow channel or fairway.

The yacht did not keep as near as was safe and practicable to the outer limit of the channel which lay on her starboard side and was thus impeding the passage of the "JOHN B. AIRD".

Rule 8 of the above Regulations, Action to avoid Collision, states in part:

(a) Any action taken to avoid collision shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.

Rule 16, Action by Give-way Vessel, states:

> Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

Rule 17, Action by Stand-on Vessel, states, in part:

(a) (i) Where one of two vessels is to keep out of the way the other shall keep her course and speed.

(ii) The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(b) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

(d) This rule does not relieve the give-way vessel of her obligation to keep out of the way.

The consequence of the failure by both vessels to maintain a proper look-out was that the action taken by the yacht to avoid collision was taken too late and the "JOHN B. AIRD", not having seen the yacht, took no action whatsoever to avoid the collision.

8. Interaction between the two vessels

When the skipper of the yacht saw the breaking bow wave of the "JOHN B. AIRD" on his starboard quarter, it was reported that the yacht's wheel was put hard-to-port immediately. The yacht's engine was turning at full cruising speed ahead at the time, and she should have turned to port. Nevertheless it was reported that her head swung to starboard across the path of the oncoming vessel.

This effect may be attributed to the fact that it is generally accepted that two vessels on parallel or near parallel courses which pass close to each other while

overtaking are subject to forces of attraction and repulsion created between them by the fore and aft acceleration of the water displaced by the overtaking vessel's bow and the overtaken vessel's stern. In the present case the interaction had the predicted effect, that as the bow of the "JOHN B. AIRD" overtook the yacht's stern, the yacht was caused to swing across the path of the overtaking vessel, in spite of the measures taken to avoid collision by the yacht's skipper.

It is possible that the yacht was not run over or capsized by the angular bulbous bow of the laker due to the fact that the yacht's starboard side collided parallel to the side of the laker's bow.

The yacht heeled to port, probably until the keel of her medium displacement hull came into contact and became pressed against the side of the laker's bow. She was retained in this position by the pressure of the water flowing past her at the "JOHN B. AIRD's" forward speed of about 11 knots. The shapes of the hull of the yacht and the 'tumble-home' of the bulbous bow were such that they complemented each other, and the yacht stayed there. When the yacht was taken out of the water for inspection and repair, it was found that the tip of her keel on the starboard side had been scraped. The port side of the keel in the same area was undamaged.

The stem of the bulbous bow of the "JOHN B. AIRD", although a standard design for a new Great Lakes vessel, is unusual in that it is relatively sharp and fitted with a knife-edge for ice-breaking.

Although one third of the yacht's length was protruding forward of the bulbous bow of the laker, the yacht did not move from this position, in spite of efforts to do so, until the speed of the "JOHN B. AIRD" had been substantially reduced. It was surprising that the yacht lodged herself across the bows of the vessel and was carried forward, relatively safely, in this way; the yachtsmen were fortuitous in the outcome.

9. Survival/Distress Equipment

Equipment on board the yacht consisted of:

8 Department of Transport (DOT) approved lifejackets;
1 DOT approved lifebuoy with line;
1 12 gauge pistol and 12 type "B" flares.

After the collision occurred each of the 3 persons on board donned a lifejacket from the easily accessible cabin deckhead stowage; however no one on board was forced to enter the water. In the stress of the moment no thought was given to using the flares by those on board the yacht.

10. Other equipment required by the Collision Regulations or the Small Vessel Regulations

The yacht had on board:

2 Magnetic compasses
1 55 lb anchor with 600 feet of line;
4 Class B1 fire extinguishers;
2 Paddles;
1 Bell;
1 Boat-hook;
2 Permanently installed automatic 12 V bilge pumps;
1 Permanently installed 12 V non automatic bilge pump;
Permanently installed side lights;
Permanently installed stern light.

The yacht did not have on board the whistle required for a vessel under 12 metres in length by the Canadian Modification to Rule 33 of the International Regulations For Preventing Collisions At Sea, 1972, nor did she have the passive radar reflector required by Rule 40 of the same regulations.

As the yacht proceeded on her voyage during daylight hours only, she was not required to display the masthead light normally required by Rule 23 of the Collision Regulations and, due to the absence of a mast she was not capable of displaying it.

11. Damage to the yacht

Damage to the yacht was limited to that caused by the flexing of the hull and bulkheads, to deep scratching of the gelcoat on the starboard side and the lower part of the keel on the same side, and to the tips of the propeller blades. Cabin windows on the starboard side were also broken.

Preliminary estimates for dismantling the interior trim, verification of bulkheads, repairing the gelcoat, and repairs to the transmission and propeller were in the $35,000 range.

12. **Licencing of yacht 32 E 30450**

The yacht was licenced at Ottawa on April 19, 1986. The owner took advice from the Canadian Coast Guard as to the equipment required for a voyage to Montréal where she is to be completed, after which it is intended that the yacht is to be registered in Canada.

Her licence number was painted on boards fixed to the forward pulpit on each side of the bow.

13. **Qualifications and experience**

a. The master of the "JOHN B. AIRD" holds a Master Inland Waters Certificate of Competency issued in Toronto in 1957. He has 40 years of seagoing experience of which 32 years have been as master. He had been aboard the vessel for 4 weeks at the time of the incident. He serves as relief master aboard the "JOHN B. AIRD" and similar company vessels. He was not on the bridge at the time of the casualty nor, necessarily, should he have been.

b. The mate of the "JOHN B. AIRD" holds a First Mate Inland Waters Certificate of Competency issued in Midland, Ont, in 1964. He has over 20 years of experience as first mate of lake vessels and is experienced in piloting vessels in the St. Lawrence River. He had been piloting the vessel for some 4 hours before the collision.

c. The second mate of the "JOHN B. AIRD" holds a CH I Certificate of Competency issued at Collingwood in 1982. He has 13 years of seagoing experience and had been OOW for about 5 hours before the collision.

d. All efforts to contact the helmsman, who had proceeded on leave before the inquiry, proved unsuccessful.

e. The skipper and owner of yacht 32 E 30450 is a marine and motor mechanic. He has several years of experience installing and maintaining engines in pleasure craft. He has 10 years of experience in power boating and has passed examinations in Boating Seamanship, Advanced Piloting and Junior Navigation set by the Canadian Power Squadron. He is the holder of a Restricted Radiotelephone Operator's Certificate, issued in Montréal, in February 1984.

f. One crew member of the yacht is a joiner and cabinet-maker. He has constructed and sailed pleasure craft in the Eastern Mediterranean, but has no formal navigation training.

g. The second crew member is a student. At the time of the collision he was below deck marking off buoys on the chart, on the instructions of the skipper. He has no navigating experience.

h. The independent witness is a university lecturer. He has several years of boating experience in the waters where the collision occurred.

Findings

The "JOHN B. AIRD" and yacht 32 E 30450 collided off Superior Shoal, NY, at approximately 1654 in daylight, and in good visibility conditions on July 30, 1986, while the Great Lakes vessel was in an overtaking situation, due to a failure by both vessels to maintain an effective lookout.

It would appear that the following factors contributed to the collision:

- the "JOHN B. AIRD", being the overtaking vessel, failed to give way to yacht 32 E 30450 as she was required to do by Rule 13 of the Collision Regulations;

- both vessels failed to maintain a proper look-out as required by Rule 5 of the Collision Regulations;

- yacht 32 E 30450 did not display a passive radar reflector as required by Rule 40 of the Collision Regulations;

- yacht 32 E 30450 was not near or at the outer limit of the channel which lay on her starboard side as required by Rule 9(a) of the Collision Regulations; and

- yacht 32 E 30450 was in such a position as to impede the passage of the "JOHN B. AIRD", in contravention of Rule 9(b) of the Collision Regulations.

Other findings

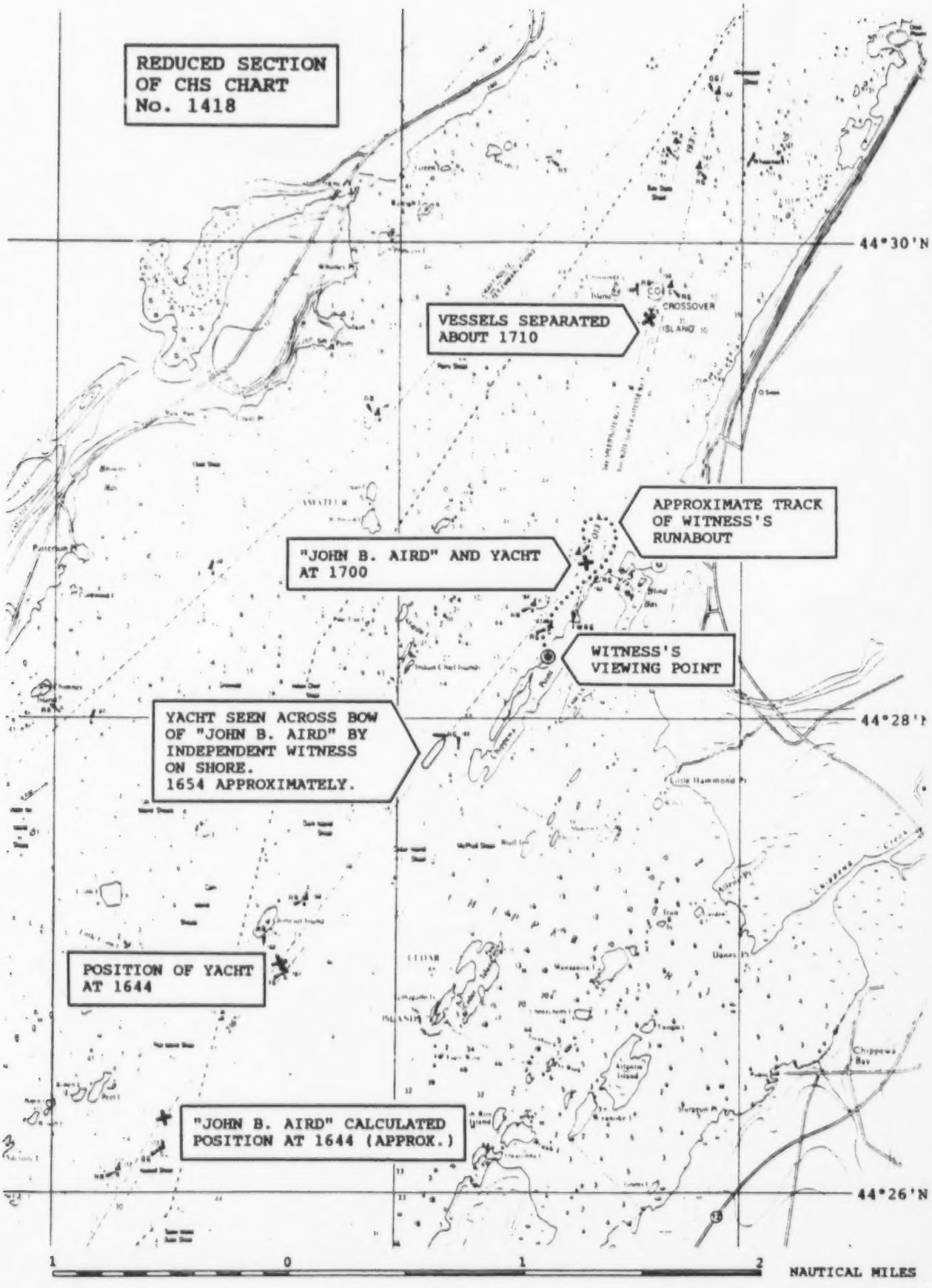
Yacht 32 E 30450 was not in possession of a Radio Station Licence for the VHF radio on board as is required by the Radio Act and its Regulations.

As a consequence of her failure to maintain a proper look-out, the "JOHN B. AIRD" was unaware of the presence of yacht 32 E 30450 on her bow for a period of at least 8 minutes.

As a consequence of her failure to maintain a proper look-out, the action taken by yacht 32 E 30450 to avoid collision under Rule 17(b) of the Collision Regulations, although correct, was taken too late.

It is probable that more serious consequences resulting from the collision were averted due to the commendable concern, presence of mind and quick action of the independent witness.

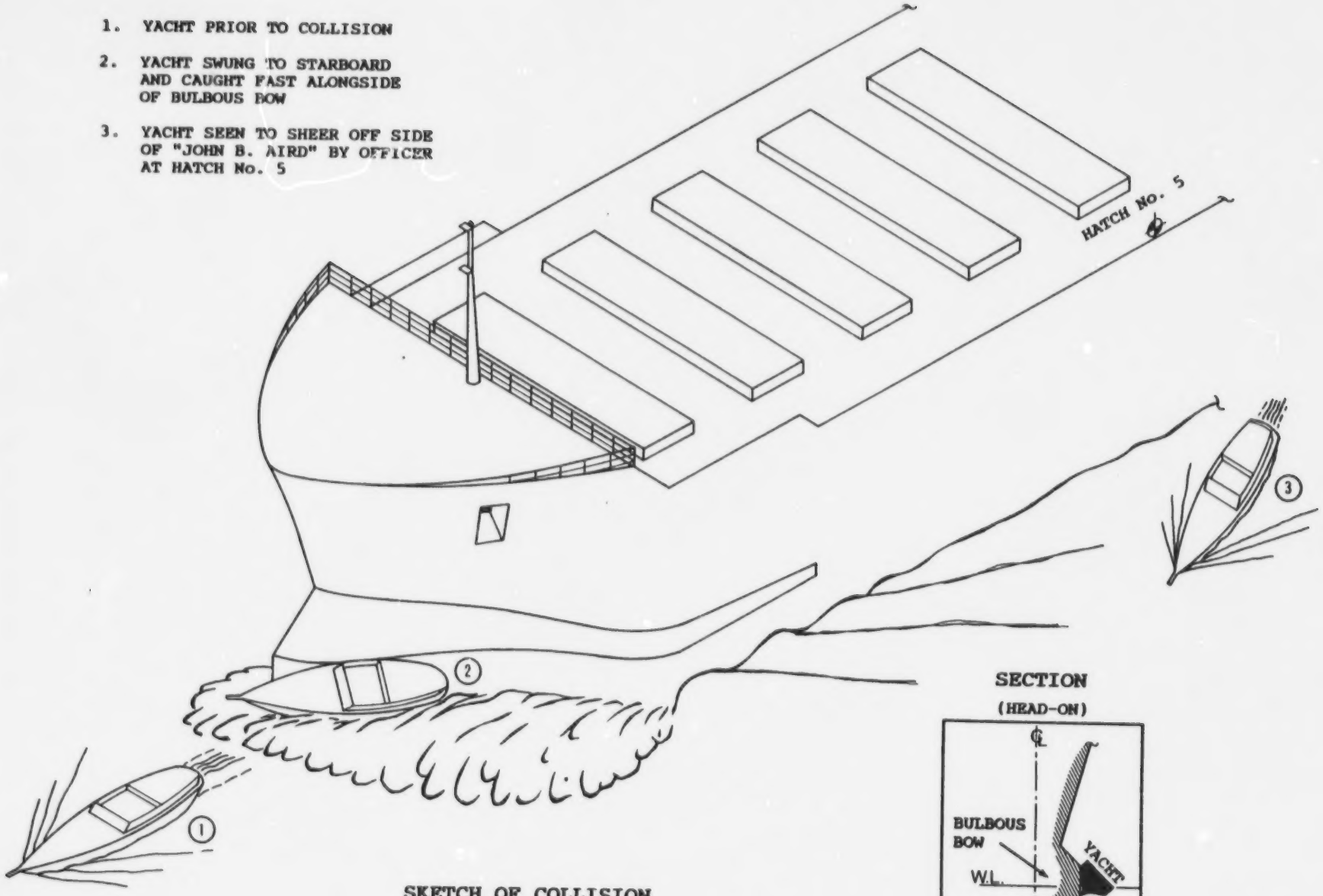
OTTAWA, ONTARIO
DECEMBER, 1986.


REDUCED SECTION OF CHS CHART No. 1418
44°30'N
VESSELS SEPARATED ABOUT 1710
CROSSOVER ISLAND
APPROXIMATE TRACK OF WITNESS'S RUNABOUT
"JOHN B. AIRD" AND YACHT AT 1700
WITNESS'S VIEWING POINT
44°28'N
YACHT SEEN ACROSS BOW OF "JOHN B. AIRD" BY INDEPENDENT WITNESS ON SHORE. 1654 APPROXIMATELY.
POSITION OF YACHT AT 1644
"JOHN B. AIRD" CALCULATED POSITION AT 1644 (APPROX.)
44°26'N
1 0 1 2
NAUTICAL MILES

1. YACHT PRIOR TO COLLISION

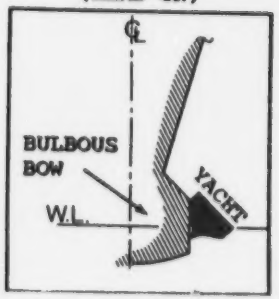
2. YACHT SWUNG TO STARBOARD AND CAUGHT FAST ALONGSIDE OF BULBOUS BOW

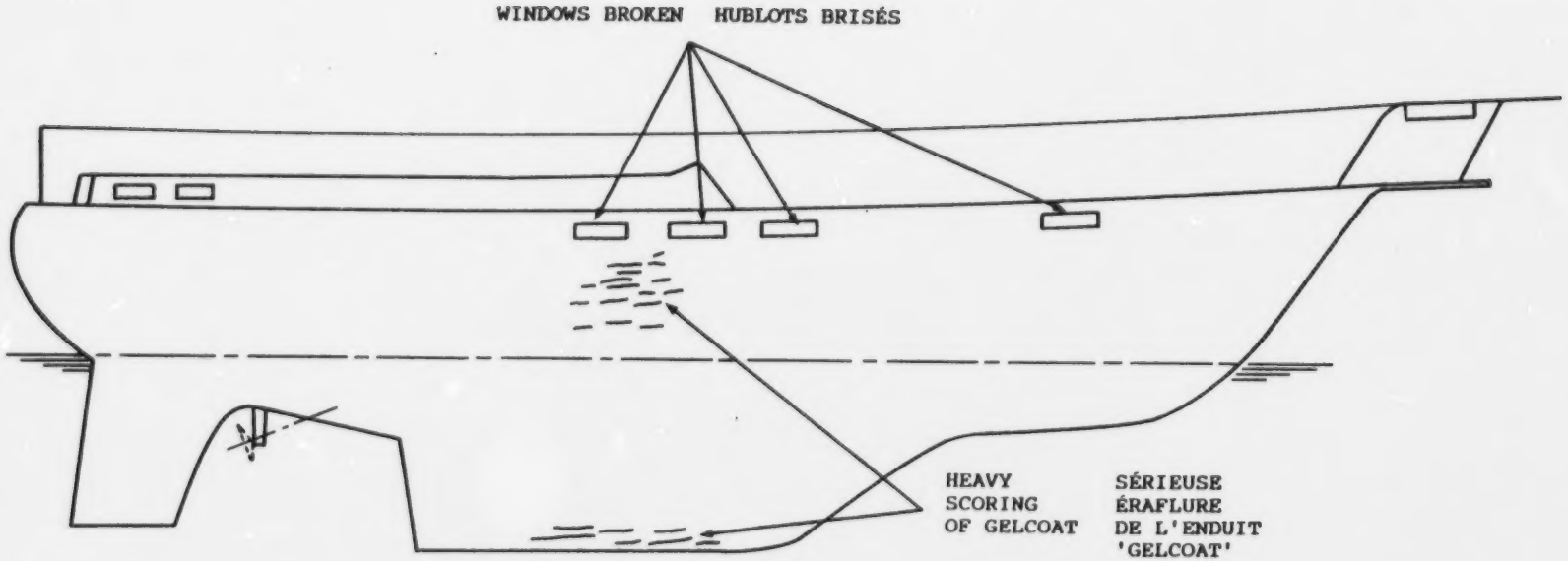
3. YACHT SEEN TO SHEER OFF SIDE OF "JOHN B. AIRD" BY OFFICER AT HATCH No. 5



SKETCH OF COLLISION

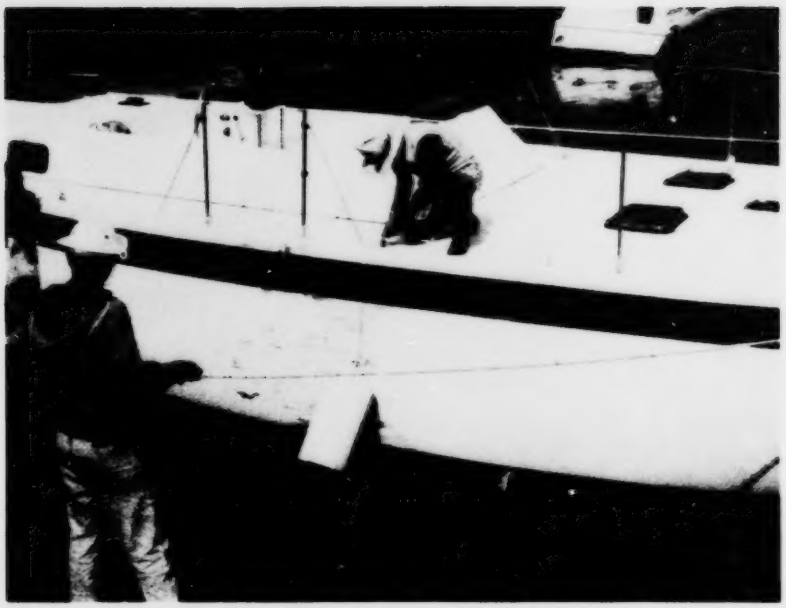
SECTION
(HEAD-ON)




WINDOWS BROKEN HUBLOTS BRISÉS
HEAVY SCORING OF GELCOAT
SÉRIEUSE ÉRAFLURE DE L'ENDUIT 'GELCOAT'

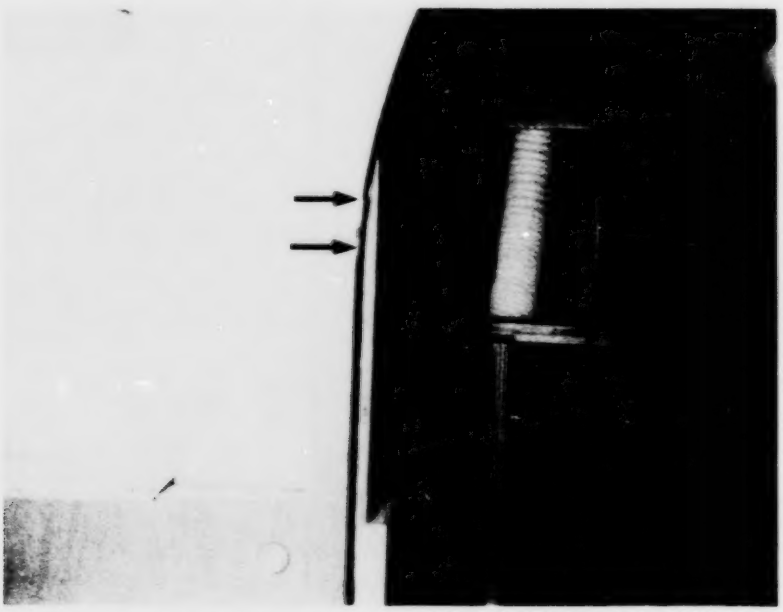
"JOHN B. AIRD"

Yacht "32E 30450"



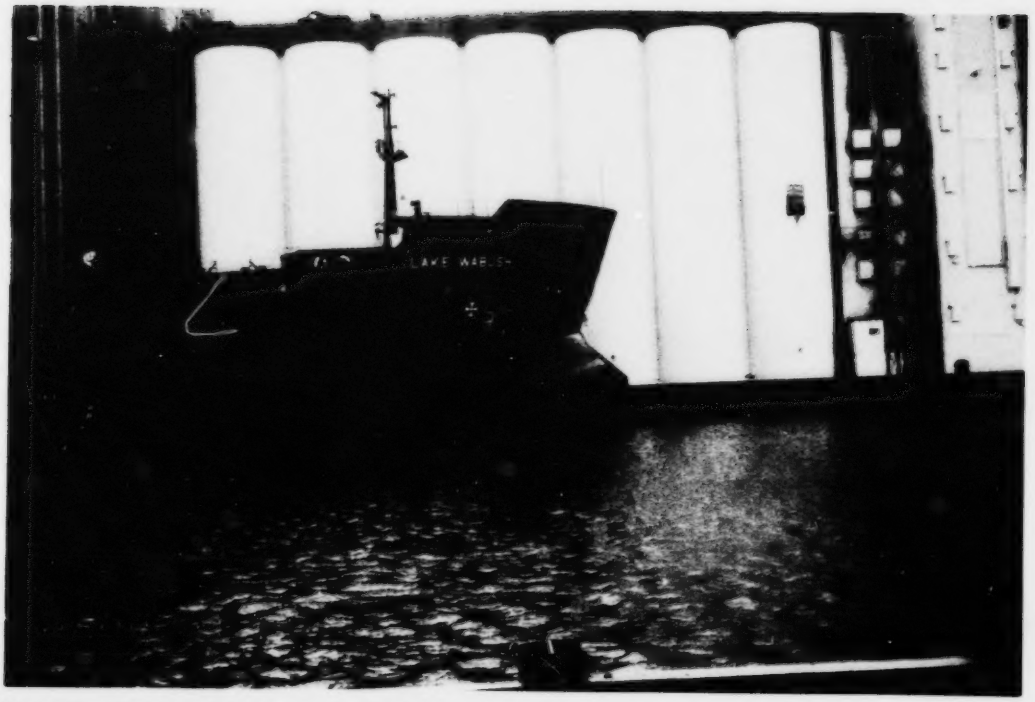
Yacht showing details of scoring and broken windows on starboard side.

On remarque sur le yacht des éraflures et des hublots brisés sur tribord.



Yacht, interior trim broken by bulkhead flexing.

Le fléchissement de la cloison a endommagé la boiserie du yacht.



"LAKE WABUSH," Great Lakes vessel with bow similar to that of the "JOHN B. AIRD".

"LAKE WABUSH" Navire des Grands Lacs avec une proue semblable à celle du "JOHN B. AIRD".

Close-up of bow. Vue de près de la proue.